Predicting The Lightning Impulse Strength Of Two Series Dielectricson Distribution Lines Using Multiple Regression Technique

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Summary

A method of estimating lightning impulse critical flashover (CFO) insulation strength of two components, combinations of four different dielectrics commonly used on distribution construction, is presented. Multiple Regression technique (MRT) has been applied to the whole CFO data population of the two dielectric combinations for the four materials namely; porcelain, wood, Reinforced Fiberglass Plastics (BRP), and polymers, to obtain a general model for CFO population of the two components in series. Also models for each specific two dielectrics combination were developed. A diagnostic correlation test is performed for the general and to each combination models, this is to decide which model fits well for the estimation of the insulation strength, and which of the two materials added to the strength of the combination. Recommendations are made regarding the more accurate prediction model, and the main factors that might have effected predicted results are pointed out. A procedure to predict values outside the experimental results range is described for other sizes and lengths of the tested components. This procedure is a good tool to be used for finding the most optimum insulation added in distribution systems